AIRSHIP

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D9.2 Stakeholders' Analysis

WP9 Task 2

Disclaimer

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Abbreviations and Acronyms

Acronym	Description
AI	Artificial Intelligence
CA	Consortium Agreement
EU	European Union
GA	Grant Agreement
KER	Key Exploitable Results
LPRC	La Palma Research Centre
UWV	Unmanned WIG Vehicle
WIG	Wing-in-Ground
WP	Work Package

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EXECUTIVE SUMMARY

This document presents the second Deliverable of *Work Package 9 – Dissemination, Outreach, and Road mapping* of the AIRSHIP project. The project partner La Palma Research Centre is the leader of the Work Package and responsible for this Deliverable.

Deliverable 9.2 – *Stakeholders' Analysis* describes the first stage of the stakeholders' mapping task and outlines the strategy for the analysis of results and subsequent parts of the stakeholders' engagement process. As such, it includes a preliminary identification of the most relevant actors around the AIRSHIP project and sets up a roadmap for their participation and inclusion across the various project dimensions.

Two significant challenges were addressed to provide useful results for the project's early stage. First, the current Technology Readiness Level (TRL) of AIRSHIP is between TRL3 (proof of concept) and TRL4 (technology validated in lab), meaning that the identification of Key stakeholders and their engagement level may change as the project progresses towards commercialization (TRL8-TRL9). Second, at Month 18, many project results are still in progress or not yet initiated. Therefore, instead of a detailed stakeholder analysis, LPRC developed a flexible framework to be used and refined throughout the implementation of Tasks 9.2 and Task 9.3. An updated stakeholder list will be provided in Month 36, once more detailed results are available and expected to remain stable until the project's conclusion. Overall, the present Deliverable concludes the first phase of the stakeholders' analysis process, consisting of the identification, screening, and preliminary engagement steps. Such a process will continue to be deployed in later stages of the project and results will be reflected in a future update of the Deliverable in M36.

As part of the stakeholders' engagement task, the clustering and road-mapping workshops, aimed at offering spaces for knowledge-exchange and discussions on common goals and solution-finding, will implement the designed mixed-methods approach to collect the inputs from several experts in the sectors related to AIRSHIP. Furthermore, the innovation strategy will analyse data from primary stakeholders to enable the Consortium to follow a value-chain-oriented holistic innovation and business agenda for the future exploitation of the AIRSHIP technology. Special attention is paid to projects and initiatives facing similar challenges and the active engagement of the involved stakeholders will facilitate synergies towards solving technical bottlenecks.

The process of identifying the preliminary list of stakeholders can be reduced to six basic steps:

1. Identification of keywords,
2. Identification of relevant projects,
3. Identification of organizations from the selected projects,

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4. Identification of private for-profit entities,
5. Identifications of organizations within the scope,
6. Stakeholder profiling.

The outcomes of the process are described in their respective sections within the Deliverable. First versions of the invitation email and the questionnaire for stakeholders are provided in the Annexes. The implementation of the stakeholders' data collection methods conducted up to the date and the available results of workshops and consultations will be annexed to this Deliverable in the M36 update. This update will also feature the final stakeholder analysis, which will be refined through Tasks 9.2 and Task 9.3, to reflect the evolving project development and ensure relevance to the project's goals.

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1. Introduction

1.1. Project Summary

The AIRSHIP project represents a groundbreaking initiative in the realm of sustainable transportation focusing on the development of an environmentally friendly, fully electric, unmanned vehicle designed for the transportation of goods. The consortium aims to leverage the ground effect phenomenon, which allows crafts to fly with enhanced lift and reduced drag, thus promising a more energy-efficient and environmentally conscious approach to air travel.

AIRSHIP is dedicated to advancing technologies in zero-emission power, onboard artificial intelligence (AI), situational awareness technologies and automatic flight control systems. These advancements are crucial for overcoming the technological challenges associated with the ground effect (also referred to as Wing-in-Ground) crafts, thereby enabling these vehicles to operate autonomously.

1.2. Deliverable scope and structure

This deliverable presents the work performed by the AIRSHIP project partner, LPRC, leader of Work Package 9, towards the stakeholders' analysis and subsequent actions of tailored communications.

The primary objective of this document is to identify who the potential stakeholders are and what they care about, so that the AIRSHIP Consortium can tailor strategies to address the concerns and interests of different stakeholder groups, thus facilitating the uptake of the AIRSHIP technologies and the exploitation of the project post-funded period.

A set of keywords used in research have been identified to isolate the most relevant stakeholders for the AIRSHIP technology and its different applications. The categorisation has followed a stakeholder identification mapping technique, further explained in Chapter 3 of this Deliverable. The above-mentioned desk research was enriched with the feedback and suggestions collected from Consortium partners.

Two methodological challenges were addressed during the stakeholder analysis: the current Technology Readiness Level (TRL) of AIRSHIP, ranging from TRL3 to TRL4, and the early stage of the project (Month 16), with many critical results still in progress. Consequently, a flexible stakeholder framework was developed, which will be refined and updated as the project progresses, incorporating results from the business plan, clustering, and roadmap tasks.

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Deliverable 9.2 is structured in four sections:

- ✓ **Introduction**: presenting the project, the objectives of the stakeholders' analysis and the subsequent structure.
- ✓ **Methodology**: explaining the approach to the analysis and the tools chosen by LPRC.
- ✓ **Stakeholders' analysis**: showing the approach, tools and results of the analysis, including the stakeholders' matrix and lists of those identified.
- ✓ **Future actions**: summarising the stakeholders' communication plan and the designed activities. Examples of questionnaires and some preliminary results are also showcased.

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2. Methodology

In order to develop the stakeholders' analysis methodology, the LPRC team reviewed the Grant Agreement and the Consortium Agreement to understand the desired outcomes of the analysis. It was found that two challenges had to be addressed to provide immediately useful results for the subsequent project implementation. Firstly, the Technology Readiness Level (TRL) of AIRSHIP currently ranges from TRL3 (Experimental proof of concept) to TRL4 (Technology validated in the lab). As the project progresses towards commercialization (TRL8-TRL9), the actual stakeholders may differ from those identified today. Secondly, the project is at an early stage (Month 16), with many critical project results still in progress (technology development, business planning) or not yet initiated (innovation agenda, roadmap). Consequently, a flexible stakeholder framework was developed instead of a traditional, detailed stakeholder analysis. This framework will be refined throughout Tasks 9.2 and 9.3 during clustering, innovation strategy, and road mapping activities. An updated and comprehensive list of the most relevant stakeholders will be provided in Month 36, once more project results are available, and this list is expected to remain stable until the project's conclusion.

Based on the main Key Exploitable Results (KER) of the AIRSHIP technology, the team decided on the keywords that would guide the desk research, and help categorise relevant stakeholders. These components mark the baseline that would sustain the rest of the actions. Once identified, desk research was carried out by the team using semantic searches on the web and especially two databases:

- ✓ CORDIS: The Community Research and Development Information Service has been the main tool to compile the research partners and funding bodies that are listed in section 3.2.1 Research Partners and section 3.2.3 Potential Investors.
- ✓ EspaceNet: The European Patent Office search engine has been used to find the ongoing technologies related to the keywords, filtering out by relevancy, novelty and geographical coverage
- ✓ Partners' input: The AIRSHIP Consortium's knowledge and insights on potential stakeholders and recommendations of projects to involve in the project have been one of the guiding principles of the upcoming stakeholders' tables.
- ✓ Search engines: The keywords were also input in general search engines and refined through filters and search exclusions. This iterative process of search and refinement was crucial for developing the first ideas of the AIRSHIP's stakeholder landscape.

It is envisioned to expand the databases towards industry-focused platforms during the second half of the analysis, which will be included in the update of this deliverable in M36.

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The final stakeholders list for each category (i.e., research partners, funding bodies, regulatory agencies, industry, end users, and other) and type of stakeholder (e.g., private corporation, EU-funded project, policymaker, producers, etc.) was manually refined, excluding those that are not relevant to the AIRSHIP Stakeholder Analysis objectives. The resulting lists are included in Chapter 3 of this deliverable.

The following table outlines the stakeholders' categories and each type of stakeholder considered per each category.

Table 1 Categorisation of stakeholders and examples

Research Partners	• Universities • Research labs • Academic Institutions • EU-funded projects
Funding Bodies	• Government agencies • Private corporations
Regulatory Agencies	• Government bodies • Port Authorities • Policymakers
Industry Partners	• Aviation industry • Marine industry • Producers • Clusters
End Users	• Operators (airlines, ferry companies) • Local Transport • Tourism Operators
Other stakeholders	• Community representatives • Non-Profit Organizations • Sustainability experts • Ports

To collect relevant feedback, expand the stakeholder mapping, and outline the emerging and future technology and innovation elements for road mapping, a mixed-methods approach involving questionnaires, and Delphi surveys has been developed. This approach is currently being implemented within the AIRSHIP Consortium, the Advisory Board members, and the clustering events' participants, and will be the main engagement tool with the stakeholders identified in this document. A selection of key stakeholders will act as primary active group to be

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invited to all clustering events and contacted to be part of data collection actions, such as questionnaires, interviews, discussion workshops, and other relevant actions pertaining to the Tasks 9.2 and 9.3. The preliminary selection is presented in 3.3.5 AIRSHIP Key stakeholders. The updated selection of stakeholders, categorised by group of stakeholder and stage of engagement will be presented in the M36 update of this deliverable, reflecting the flexible approach and refinements based on project progress and outcomes.

2.1. Objectives and Outcomes

A stakeholders' analysis is carried out in order to better understand the innovation, market, and political ecosystem around the project through the identification of stakeholders and their classification, thus allowing for a bird view of the most active stakeholders and development areas which will be the cornerstone of *Task 9.3 – Innovation strategy and Road mapping*, and the exploitation of the project after the funded period.

The final aim of the AIRSHIP stakeholders' engagement actions is to collect expert information useful for the market analysis and validation of results, as well as serving as a beacon to communicate the AIRSHIP project within the relevant communities and ease the future exploitation of the technology.

2.2. Search Parameters

The first step to specify parameters for the desk research was the definition of the keywords to be used. The keywords were decided through a review of the Grant Agreement and Consortium Agreement of the project.

Table 2. Keywords used for stakeholders' analysis desk research		
General	**Technologies**	**Environmental**
Ekranoplan	WIG	Sustainable transport
Flying ship	Zero-emissions transport	Energy efficient transport
Inter-island transport	On-board AI	Acoustic/noise pollution
Inland waterway transport	Automatic flight control	Carbon footprint
Autonomous ship	Unmanned WIG Vehicle (UWV)	Environmental footprint
Autonomous transport	Unmanned ship/vessel	Sustainable ports
Transportation of goods	Electric ship/vessel	
	Wing in ground/Wing-in-Ground	
	Ground effect	
	WISES wing in ground surface ship	
	Ground effect craft	
Source: Own elaboration from identified databases (CORDIS, EspaceNet) and AIRSHIP Consortium contributions.		

Table 1 - Keywords used for the stakeholders' analysis desk research

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These keywords were later used to perform the desk research. To ensure the relevancy of the results, the following boundaries were decided for the **CORDIS** search query:

- Domain of application: Transport and Mobility,
- Field of science: Engineering and Technology,

Figure 1 Cordis Logo

The second tool used was **EspaceNet**, the search tool of the **European Patent's Office**. Similarly to CORDIS, boundaries had to be defined:

- Geographical boundaries: European Union (EU)
- Field of application: Transport

Figure 2 - EspaceNet logo

Desk research in search engines (e.g. Google) was used to broaden the pool of stakeholders and to clarify their roles and classification.

The most crucial input was provided by the **AIRSHIP consortium** through their own contacts and knowledge of the innovation and industrial ecosystems of their respective areas.

2.3. Identification of Research Partners

For the purpose of this document, "research partners" are defined as those institutions or projects that have the resources and expertise to conduct in-depth studies on WIG crafts and further the development of the AIRSHIP. In order to identify the relevant research partners, results from CORDIS, search engines and the Consortium partners suggestions were refined manually, analysing each project individually and extracting the members of each Consortium for a better categorisation of fields and topics addressed, as well as geographical scope and technology development levels. A categorisation of the entities followed, allowing LPRC to locate the most relevant and active innovators in the European Research & Development landscape through a prioritisation scale of 1-3. A resulting list of innovators and a stakeholders' networking analysis is presented in part 3.3.1 Research Partners.

2.4. Identification of Funding Bodies

The role of the funding bodies in AIRSHIP is to provide the necessary financial support for the research and development of the technologies in future research or exploitation. Those EU funding bodies that could fund

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upscaling of the AIRSHIP. The Funding Bodies listed in part 3.3.2. Funding Bodies will be considered towards the exploitation of the project.

2.5. Identification of Regulatory Agencies

The national and regional bodies that oversee the safety, legality, and environmental impact of WIG crafts. They would be involved in approving designs, setting standards, and ensuring compliance. During this deliverable, the bodies prioritised will be those on the areas where testing of the models is foreseen or taking place at the moment of writing this document. Other regulatory agencies linked to previous WIG crafts' test areas or projects or that are actively using similar vessels or technologies are also included in the analysis.

The Regulatory Agencies are key stakeholders and essential to the success of the project and the adoption of WIG crafts and the novel technologies of AIRSHIP and are identified in part 3.3.3. Regulatory Agencies .

2.6. Identification of Industry Partners

For the purposes of this document, "industry partners" refers to those entities either within or closely linked to industry that could provide practical insights, technical expertise, and potential applications for WIG crafts. Aviation and marine industry, as well as producers and clusters of companies are listed in the preliminary industry stakeholders identified through the stakeholders' analysis work is included in part 3.3.4 Identification of Industry Partners of this document.

2.7. Identification of Potential End Users

The end users of AIRSHIP are commercial or military organizations that would use and invest in the WIG crafts once they are developed. Their inclusion in the project aims at guiding the research towards practical and useful outcomes through the end users' requirements and feedback. Some examples of end users are operators, local transport and parcel delivery, and tourism operators. Their priorities, needs, and feedback will be systematically collected through the actions developed under Task 9.2 and Task 9.3.

The extensive list of potential end-users has been manually reduced to those who are or potentially could be active stakeholders in the project. This is, to avoid broadening to much the scope of potential stakeholders to be engaged, which would eventually delude the focus of such an engagement. Hence, the list has been adjusted to those who are already participating in the clustering events or are part of the Consortium's collaborators list. It can be found in part 3.3.5 Potential end users in this document.

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2.8. Other stakeholders

Other types of stakeholders not directly linked to the development, exploitation or commercialization of the technologies will also be considered in this analysis and during the project. Their engagement on the project is expected to be on a consultation level. As the work towards these types of stakeholders has not yet started, the classification will be composed of a preliminary list of those entities or individuals related to cross-cutting issues relevant to the AIRSHIP project, such as community representatives or sustainability experts. The list and logical framework for identifying said stakeholders are detailed in part 3.3.6 Other stakeholders of this deliverable.

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3. Stakeholders' Analysis

This section shows the stakeholders' identification mapping (subsection 3.1), as well as the keyword search results (subsection 3.2), and the description of the stakeholders' groups (subsection 3.3). It is worth emphasising that the analysis provided in this deliverable is

3.1. Stakeholders' identification mapping

The first step towards a comprehensive stakeholders' analysis is a stakeholders' mapping. Stakeholder mapping refers to the processes of actively identifying, categorising, and prioritising potential stakeholders to facilitate decision making (Reed et al., 2009; Shirey, 2012).

The Mendelow's Matrix for Stakeholders Analysis, also known as the Power/Interest matrix, is used here to prioritize and inform the level of engagement provided by each stakeholder. The analysis is informed by degree of interest and power held by each potential stakeholder:

a) Stakeholders' potential role: Knowledge producer, technology advancer, possible sponsor, etc.
b) Expected contribution: Does the stakeholder have information, counsel of expertise that could be helpful towards the advancement of the project, the AIRSHIP commercialization or furthering the technology be it within or post-funded period?
c) Willingness to engage: Has the stakeholder shown willingness to be part of the process? Have they engaged in similar projects before? Are they part of the partners' active network?
d) Influence: How much does the stakeholder influence the success of the project? Where does this influence lay? Who do they influence?
e) Importance of involvement: Could the inclusion or exclusion of said stakeholder have a significant impact in the success of the project?

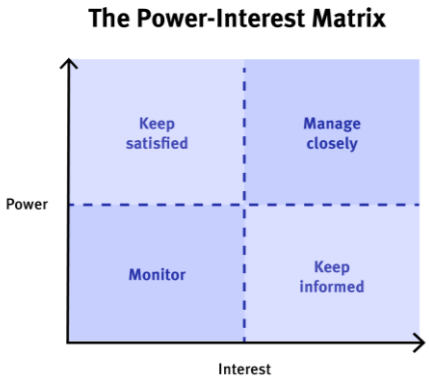

Figure 3 - The Power-Interest Matrix or Mendelow's matrix

A more comprehensive list of stakeholders and ranking by each Mendelow's Matrix Category is included in the following sections per each stakeholders' category.

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3.2. Keywords search results

A desk research based on the selected keywords was conducted with the aim of finding patents and projects relevant to the project's objectives. These results are the building blocks for the rest of the analysis and mean the start of the analysis.

The preliminary list of results is shown below:

Table 2. 2 Preliminary results of the desk research

Keywords	CORDIS hits	EspaceNet hits
Ekranoplan	0	206
Flying ship	20	297
Ground effect	8	25
Inter-island transport	0	0
Inland waters transport	1	0
Autonomous ship(s)	31	65
Autonomous transport	3	158
Wing-in-ground	110	235
Zero-emissions	185	643
On-board AI	0	19
Automatic flight control	14	2116
UWV	0	0
Unmanned vehicle	15	NA
Electric vessel	28	2
Wing In Ground / Wing-in-Ground	12	9
Ground effect	71	20
WISES wing in ground surface ship	0	16
Transportation of goods	58	NA
Acoustic noise pollution	9	NA
Carbon footprint	16	NA
Aeronautics	111	NA
Environmental footprint	18	NA
Sustainable transport	194	NA
NA = impossible to reduce / non-relevant results		

A manual classification of the results was carried out by the LPRC team. The first step was the extraction of research projects or low TRL patents. Once this list was accomplished, the corresponding partners or consortia or patent owners were identified and added to the stakeholders' table.

The rest of the table was once again reviewed to ensure the relevancy of the patents, companies and patent owners to the AIRSHIP project. The innovations having advanced further along on the state-of-the-art than the actual situation of the project were given special consideration and have been the ones added to the stakeholders table.

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The process of classification can be summed up in this manner:

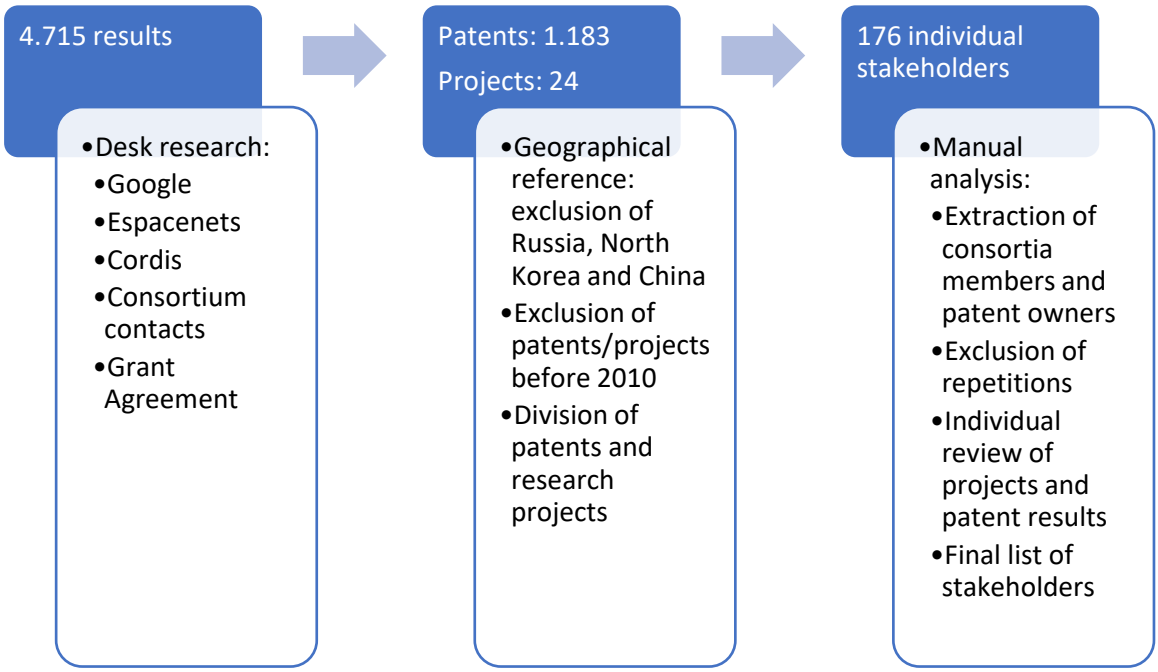

Figure 4. Stakeholders' Analysis process

Before proceeding to the classified results, some general considerations were extracted from the data:

- Most of the stakeholders in Europe are in **Germany**, the **UK** and **Italy**.
- The majority of the patents are based on **inland waterways transport**.
- Most of the technologies are also being developed for **defence and military use**.
- While there are some innovators working in inter-island use of WIG crafts within Europe, it is an important focus in **Asia**, where crafts like the AIRFISH are currently being tested for both civil and military applications.

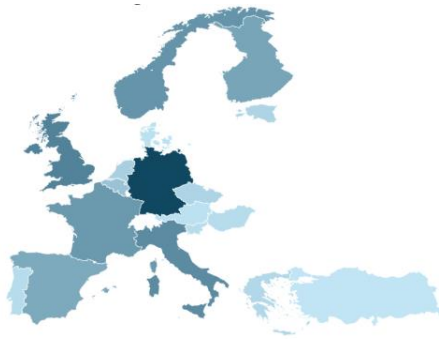

Figure 5 Heat map of the AIRSHIP stakeholders

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3.3. Related EU-funded projects

As an important start of this current task, the team has identified 21 EU-funded research and development projects closely related to the AIRSHIP project objectives.

The analysis of the consortia of the projects has acted as pool for the rest of the stakeholders' analysis and most of the participants are also classified in the upcoming categories (regulatory agencies, industry, etc.). The criteria followed for the classification prioritizes those entities that have successfully developed innovations with the closest relationships to the objectives of the project.

Table 3 EU funded projects and consortia list

AIRSHIP project partners

	PROJECT DESCRIPTION	CONSORTIUM
ACACIA	The project aims at improving the scientific understanding of the non-CO2 effects, in particular, the indirect effect of aviation soot and aerosol on clouds. It will identify the need for international measurement campaigns and strive to put all aviation effects on a common scale to provide an updated climate impact assessment. Finally, the project will provide the knowledge basis and strategic guidance for future implementation of mitigation options, giving robust recommendations for no-regret strategies for reducing the climate impact of aviation. **START**: 01/01/2020 **END**: 29/02/2024 **FUNDED UNDER**: Smart, Green And Integrated Transport	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT
		The Manchester Metropolitan University
		The University of Reading
		Universität Wien
		Eidgenössische Technische Hochschule Zürich
		Universität Leipzig
		Technische Universiteit Delft
		Zürcher Hochschule für Angewandte Wissenschaften
		CICERO Senter for Klimaforskning
		Forschungszentrum Jülich GmbH
		Centre National de la Recherche Scientifique
EfficientFlow	The Baltic ports of Rauma and Gävle implement efficient port calls using real-time information. Improved traffic flow converts unsafe waiting times into bunker savings for large ships in the narrow Swedish and Finnish archipelagos. **START**:01/01/2018 **END**: 30/12/2021 **FUNDED UNDER**: ERDF / Interreg Baltic	Satakunta University of Applied Sciences
		Fintraffic
		Port of Rauma
		Port of Gävle
		Swedish Maritime Administration
HyekoTank	The EU-funded HyEkoTank project will develop a 2.4 MW fuel cell system on the 18 600 deadweight tonnage (DWT) product tanker. The hydrogen tanker concept will be a state-of-the-art vessel retrofitted to reduce greenhouse gas emissions during voyage and in port by 100 %. **START**: 01/02/2023 **END**: 31/01/2026 **FUNDED UNDER**: Climate, Energy and Mobility	NESTE OYJ
		TECO 2030
		Shell
		EKTANK AB
		Fartygskonstruktioner AB
		Blom Maritime
		UMOE Advanced Composites
		University of Tromsø (UIT)

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PortSounds	The main objective of the LIFE PortSounds project is to reduce the impact of underwater noise on the marine environment of the Port of Cartagena.**START**: 01/09/2021 **END**:31/12/2025 **FUNDED UNDER:** LiFE	Port Authority of Cartagena Asociación Centro Tecnológico Naval y del Mar (CTN) Universidad Politécnica de Cartagena (UPCT) Universitat Politècnica de València (UPV)
CRISTAL	The EU-funded CRISTAL project aims to increase the amount of freight transported via inland waterways by a minimum of 20 % over three years and to improve reliability by 80 %. The project will be conducted at three pilot sites in Italy, Poland and France. There, researchers will focus on creating cooperative solutions which include: technological innovation and digitalisation, advancement towards the physical internet, as well as governance and business models. The project will also seek to make transport corridors more resilient, ensuring that capacity can remain at 50 % even during extreme weather events. **START**: 1/09/2022 **END:** 31/08/2025 **FUNDED UNDER:** Climate, Energy and Mobility	Łukasiewicz - Poznań Institute of Technology ALICE (Alliance for Logistics Innovation in Europe) ENEA AIPo Fraunhofer-Gesellschaft Infrastrutture Venete Società di consulenza - SOGESCA Universiteit Antwerpen University of Gdańsk VNF - Voies Navigables de France KTI Közlekedéstudományi Intézet Nonprofit Kft. CERTH Unioncamere Uniontransporti EUROMOBILITA s.r.o. Newcastle University
H2SHIPS	The Interreg North-West Europe project H2SHIPS will demonstrate the technical and economic feasibility of hydrogen bunkering and propulsion for shipping and will identify the conditions for successful market entry for the technology. Two pilot projects will be implemented as part of H2SHIPS: A new hydrogen powered port vessel will be built in Amsterdam and in Belgium, ancillary equipment will be erected to power wind farm maintenance vessels and ensure safe and efficient operation of a newly built hydrogen refuelling station. **START:** 2019 **END:** 2022 **FUNDED UNDER:** Interreg North-West Europe	Wilh Wilhelmsen Holding ASA Kongsberg Maritime AS Lmg Marin France Eidgenoessische Technische Hochschule Zuerich Norled AS DNV GL SE PERSEE Air Liquide Norway AS Equinor Energy AS National Center for Scientific Research "Demokritos" University of Strathclyde Stolt Tankers B.V. DIANA Shipping Services SA MARITIME CLEANTECH
AUTOSHIP	The project aims to build and demonstrate two self-navigating ships as prototypes for a fleet of next-generation, fully-autonomous vessels. The scheme includes the necessary shore control network and technology package for autonomous navigation and secure communications. Two pilot tests will take place demonstrating goods transport along the Baltic Corridor. **START:** 12/04/2019 **END:** 30/11/2023 **FUNDED UNDER:** SOCIETAL CHALLENGES - Smart, Green And Integrated Transport	Ciaotech Srl Kongsberg Maritime As Sintef Ocean AS University of Strathclyde Bureau Veritas Marine & Offshore De Vlaamse Waterweg - Belgium Eidsvaag As - Norway Zulu Associates

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AUTOFLEX	The initiative aims to develop new autonomous cargo vessels for small waterways, with a focus on reliability in low water situations. Distribution hubs will be designed as a link between water and road transport, providing zero-emission energy supply for ships and trucks. Two use cases in the Randstad region and Ghent will test the new concepts, validating ship designs and proposing interface standards. **START:** 01/01/2024 **END:** 31/12/2026 **FUNDED UNDER:** Climate, Energy and Mobility	SINTEF Ocean AS
		DFDS AS
		Ethnicon Metsovion Polytechnion
		Institut für Strukturleichtbau und Energieeffizienz
		Maritime Robotics
		Fraunhofer CML
		DST (Development Centre for Ship Technology)
		Zero Emission Services
ETNA 2020	The EU-funded ETNA 2020 project will build upon and enhance its predecessor's efforts, focusing on facilitating cooperation among National Contact Points (NCPs) for 'Smart, Green and Integrated Transport'. The project aims to enhance understanding of the EU Transport R&I landscape, strengthen NCPs' capacity building, upgrade NCP assistance tools, promote stakeholder involvement in Horizon 2020 funding opportunities, and facilitate networking within the 'Smart, Green and Integrated Transport' community. **START:** 01/01/2016 **END:** 31/12/2020 **FUNDED UNDER:** SOCIETAL CHALLENGES - Smart, Green And Integrated Transport	Agenzia per la Promozione della Ricerca Europea
		Academia De Studii Economice Din Bucuresti
		Agence Bruxelloise pour l'Accompagnement de l'Entreprise
		Centro para el Desarrollo Tecnologico e Innovacion E.P.E.
		Centrum Vedecko Technickych Informacii Slovenskej Republiky
		Enterprise Ireland
		Fundacao para a Ciencia e a Tecnologia
		Universite Gustave Eiffel
		United Kingdom Research and Innovation
		Instytut Podstawowych Problemow Techniki Polskiej Akademii Nauk
		Idryma Technologias Kai Erevnas
		Idryma Erevnas Kai Kainotomias
		Rigas Tehniska Universitate
		Ministerie Van Economische Zaken En Klimaat
		University of Mostar
		National Technological Innovation Authority
I2MPECT	The project aims to demonstrate advancements in power converters for harsh environments through innovative 3D device packaging and active thermal management. **START**: 01/05/2015 **END**: 30/04/2018 **FUNDED UNDER:** SOCIETAL CHALLENGES - Smart, Green And Integrated Transport	AIRBUS DEFENCE AND SPACE GMBH
		Eidgenoessische Technische Hochschule Zuerich
		The University of Sheffield
		DYNEX SEMICONDUCTOR LIMITED
		SAFRAN Electrical & Power
		Institut National des Sciences Appliquées De Lyon
		K & S GMBH PROJEKTMANAGEMENT
		AIRBUS OPERATIONS SAS
MADELEINE	The project will improve competitiveness and enhance the use of green technologies in aeronautical industrial design for excellent large-scale industrial design. This goal will be achieved through the enhancement of capabilities, the introduction of multi-physics software add-ons, and the maximisation of benefits from computationally intensive simulations. MADELEINE will raise the technology readiness levels and demonstrate the advantages of high-fidelity adjoint-based multidisciplinary optimisation. **START:** 01/06/20218 **END:** 30/11/2021 **FUNDED UNDER:**Smart, Green And Integrated Transport	Office National d'Etudes et de Recherches Aerospatiales
		Rolls-Royce PLC
		AIRBUS OPERATIONS SAS
		ESI Group
		DASSAULT Aviation
		OPTIMAD Engineering SRL
		Deutsches Zentrum Fur Luft - Und Raumfahrt EV
		Ethnicon Metsovion Polytechnion
		University of Sheffield
		Universita degli Studi di Cagliari
		Technische Universitaet Muenchen
		IRT Antoine de Saint Exupery
		University of Southampton
		L - UP SAS

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PARSIFAL	The project is focused on the medium size commercial aircraft category, in which the adoption of the PrP configuration can confer to aircraft with the same overall dimensions and fuel consumption of an A320/B737 the payload capacity of an A330/B767. START: 01/05/2017 END: 31/07/2020 FUNDED UNDER: Smart, Green And Integrated Transport	Technische Universiteit DELFT ONERA - The French Aerospace Lab DLR (German Aerospace Center) Ecole Nationale Superieure D'arts et Metiers SKYBOX ENGINEERING SRL
VISION	VISION is a HORIZON 2020 Europe-Japan collaborative research project, intending to develop and to validate smarter technologies for aircraft Guidance, Navigation and Control by integrating onboard vision system and advanced fault detection and resilient methods. The project aims at contributing to the global civil aviation goal of accident rate reduction. START: 01/03/2016 END: 31/08/2019 FUNDED UNDER: - Smart, Green And Integrated Transport	University of Exeter University of Bristol Hun-Ren Szamitastechnikai es Automatizalasi Kutatointezet ONERA - The French Aerospace Lab UNMANNED SOLUTIONS SL DASSAULT Aviation
UNEXMIN	This project will develop a novel robotic system for the autonomous exploration and mapping of Europe's flooded mines. The Robotic Explorer (UX-1) will use non-invasive methods for autonomous 3D mine mapping for gathering valuable geological and mineralogical information. This will open new exploration scenarios so that strategic decisions on the re-opening of Europe's abandoned mines could be supported by actualised data that can not be obtained by any other ways. START: 01/02/2016 END:31/10/2019 FUNDED UNDER: SOCIETAL CHALLENGES - Climate action, Environment, Resource Efficiency and Raw Materials	University of Miskolc GeoZs (Geological Survey of Slovenia) Tampere University La Palma Research Centre Universidad Politécnica de Madrid INESC TEC Ecton Mine Educational Trust Tampere University of Technology Resources Computing International Ltd (4dcoders) Ecton Mine Educational Trust GeoMontan European Federation of Geologists Empresa de Desenvolvimento Mineiro, S.A. Idrija Mercury Heritage Management Centre
UNEXUP	UNEXUP converts R&D results from the UNEXMIN project into a commercial service to resurvey Europe's flooded underground mines. Improvements will be made to the UX-1 research prototype, raising technology readiness to TRL 7/8. A "real service-to-real client" approach will be demonstrated, supporting mineral exploration and mine surveying efforts in Europe with unique data from flooded environments that cannot be obtained economically otherwise. START: 01/01/2020 END:31/12/2022 FUNDED UNDER: EIT - Raw Materials	La Palma Research Centre for Future Studies SL University of Miskolc Universidad Politécnica de Madrid (UPM) Tampere University INESC TEC GeoZS (Geological Survey of Slovenia) Resources Computing International Ltd (4dcoders) UNEXMIN GeoRobotics
AIR (CleanSky)	Clean Sky aims to develop cleaner air transport technologies for earliest possible deployment. That means integrating, demonstrating and validating technologies capable of reducing CO2, NOx and noise emissions by 20 to 30% compared to 'state-of-the-art' aircraft entering into service as from 2014. Besides improving the environmental impact of aeronautical technologies, including those related to small aviation,	Airbus SAAB Technologies Dassault Aviation Rolls-Royce Leonardo Safran MTU Aero Engines

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	the objective of Clean Sky 2 is also to develop a strong and globally competitive aeronautical industry and supply chain in Europe. **Strategic Research and Innovation Agenda (SRIA).**	Piaggio Aerospace
		Liebherr Aerospace
		Fraunhofer-Gesellschaft
		THALES
		DLR (German Aerospace Center)
		Evektor
P2P (H2020)	The proposed project will build upon extensive experience of the consortium on Information and Communications Technologies (ICT), especially ICT for the Energy Sector, Smart Grids including Distributed Energy Resources (DER) integration, MicroGrids, CELLs, Virtual Power Plants etc., power system economics, electricity markets and business models. **START**: 01/01/2015 **END**: 31/12/2017 **FUNDED UNDER:** SOCIETAL CHALLENGES - Secure, clean and efficient energy	Oulun Yliopisto
		University of Bath
		Cardiff University
		Fundación CENER
		Centre Tecnologic de Telecomunicacions de Catalunya
		Instrumentacion y Componentes SA
		Katholieke Universiteit Leuven
		REGENERA LEVANTE SL
		ENDESA SA
RTF	The project makes real-time information about ferry delays, cancellations and travel time prognoses available to travel planning systems that cover different modes of transport. Real-time travel information is an immensely dynamic field – and ferry transportation is currently at risk of being left behind. The project sets up a collaborative data hub for real-time ferry information to be used for smoother transport of goods and people in the Baltic Sea region. **START**: 01/10/2017 **END**: 30/09/2020 **FUNDED UNDER**: Interreg Baltic Sea Region	University og Rostock
		VBB Public Transportation Association
		Baltic Sea Forum
		Schenker Deutschland AG
		Swedish Maritime Administration
		RISE AB
		Skanetrafiken
		Stena Line Scandinavia AB
		Viking Line Abp
		Helsinki Region Transport
		West Pomeranian University of Technology
		NPPE Klaipeda Shipping Research Center
		A'Tuin LLC
		International Transport Development Association
		Estonian Small Harbours Development Center
		Saarte Liini Ltd
		Motus Foundation
		Linda Line Express
		Tallin University of Technology
		Estonian Road Administration
		Port of Trelleborg
Green Small Craft	The project contributes to pollution reduction and emission mitigation of small craft operation in the Baltic Sea, emphasizing on high-speed. **START**: 01/10/2020 **END**: 30/09/2021 **FUNDED UNDER**: Interreg Baltic Sea Region	Gdansk University of Technology
		Tallinn University of Technology
		Aalto University Foundation

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SEAWINGS	SEAWINGS proposes the development of wing-in-ground effect vehicles (WIG vehicles) designed to increase strategic preparedness and to perform defence-related operations and missions in the sea/air interface in Europe. **START**: 01/10/2020 **END**: 30/09/2021 **FUNDED UNDER:** European Defence Fund	La Palma Research Centre for Future Studies SL
		Universidad Politécnica de Madrid
		INESC TEC
		Zanasi &Partners
		TRISOLARIS
		Porvalor
ZEMSHIPS	Zemships (Zero EmissionShips) is an EU-supported project. Its objective is to develop and operate a fuel-cell powered Alster excursion ship as well as a hydrogen fuelling station. Projects such as Zemships can provide important findings for the future expansion of applications for fuel cell technology. **START**: 01/01/2006 **END**: 30/12/2010 **FUNDED UNDER**: FP7	City of Hamburg
		HHA Hamburger Hochbahn Aktiengesellschaft
		Alster Touristik GmbH
		Proton Motor Fuel Cell GmbH
		Linde AG (SID-Advanced Customer Aplications)
		Germanische Lloyd AG (Process-and Fuel Cell Technology)
		Hochschule für Angewandte Wissenschaften
		Nuclear Research Institute plc
		ETC-Consulting Group Ltd

After analysing the consortia and the networking map of the project, the following conclusions were drawn by the tean:

- There are already strong research networks in Europe towards the use of green technologies in aeronautical industrial design, of which several of the AIRSHIP partners are part of.
- Most of the identified consortium members are Universities or research centres, alongside big industry names, such as Boeing.
- The Green Small Craft, RTF and Efficient Flow projects are to be prioritized for the upcoming clustering event, as they group some of the strongest research partners and have the most consistent results and outcomes from the projects that will be of great importance for the success of AIRSHIP.

3.4. Stakeholders' groups

This subsection displays the entities identified for each stakeholder group. The stakeholder group tables are composed of the following elements:

- Stakeholders' name.
- Country.
- Entity type: Four main types of entities are defined 1) private companies, 2) research centres, 3) universities and 4) public entities or governments. This information will guide the type of activities each stakeholder will be participating in.

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- Priority level: The levels are informed by the Mendelow's matrix classification. Accordingly, they are ranked as follows:
    - Key players: Their inclusion in the project would make a big difference in the success of the outcomes.
    - Keep satisfied: Their input can be key for parts of the project and, specifically, for the post-funded exploitation of the project.
    - Keep informed: Participation, though not crucial, can be beneficial.
    - Low effort: Though their work is relevant for the interests of the project, they are not prioritized at this moment.
- Engagement:
    - Active: These stakeholders are already actively involved in the actions of the project.
    - In process of engaging: They have shown interest but, at the moment, they have not actively participated in AIRSHIP.
    - To be contacted: They are in the planning for the upcoming actions of the project but have not yet been personally contacted.
    - Passive: They are to be reached through social media, newsletters, events, etc. at the moment.

As previously stated, due to the phase of the project we are in, these lists and classifications are preliminary to the work and final engagement. It is expected that the priority levels and engagement could change throughout the development of the actions.

For all the upcoming tables, only those stakeholders that ranked in levels 1 (Key Players), 2 (Keep satisfied), 3 (Keep informed) as per the stakeholders matrix are included, while those who are at this stage in level 4 (Low effort) are only included in the complete table of all stakeholders identified in Annex III.

3.3.1. Research Partners

The majority of the stakeholders are in the field of research and development and have been part of projects relevant to AIRSHIP. The main tools used to identify the innovators have been the Grant Agreement, CORDIS, search engines and consultation with the consortium partners.

The identification of innovators in the context of this deliverable is aimed at creating synergies towards the improvement of the AIRSHIP technologies through collaboration in the clustering and roadmap workshops. A set of questions were selected at the beginning to be addressed through the analysis of the results:

- Who are the main EU innovators in the project's competence domains?

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- What are said innovators working on?
- How can we better create synergies with the Key Players?
- Does the consortium have active links with the identified innovators?

Those stakeholders with an active involvement in the project at the current stage are in bold font.

Table 4. Research partners list

	Stakeholders name
Key Players	ALICE (Eviation)
	Zemships
	University of Las Palmas of Gran Canaria
	Oceanic Platform of the Canary Island
Keep satisfied	ONERA - The French Aerospace Lab
	DLR (German Aerospace Center)
	CIRA (Italian Aerospace Research Centre)
	Vaeridion
	Cyprus Marine and Maritime Institute
Keep informed	Deutsches Zentrum Fur Luft - Und Raumfahrt Ev
	CICERO Senter for Klimaforskning
	Asociación Centro Tecnológico Naval y del Mar (CTN)
	Universidad Politécnica de Cartagena (UPCT)
	Universitat Politècnica de València (UPV)
	Universiteit Antwerpen
	University of Gdańsk
	Technische Universität Berlin (TUB)
	Zulu Associates
	CETENA S.p.A.
	CEITEC - Central European Institute of Technology
	Deutsches Zentrum für Luft- und Raumfahrt (DLR)
	Cobham Aerospace Communications
	ONERA - The French Aerospace Lab
	Luleå University of Technology
	Blekinge Institute of Technology
	Kaunas University of Technology
	Gdansk University of Technology
	Riga Technical University
	Lappeenranta-Lahti University of Technology LUT
	Vilnius Gediminas Technical University
	University of Tartu

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	Marstal School of Maritime and Technical Engineering
	Chalmers University of Technology
	Kiel University
	Aalto University Foundation
	University of the Aegean
	Technological Institute for Renewable Energies of the Canary Islands
	Zanasi &Partners
	Porvalor

3.3.2. Funding Bodies

AIRSHIP aims to have a maximum TRL of 5 by the completion of the project, nonetheless, Work Package 9, through the exploitation task, will work towards ensuring the continuation and improvement of the results during the post-funded period. Accordingly, funding bodies currently targeting AIRSHIP's interest towards the exploitation of the technologies are mapped in this section.

At the moment of writing this deliverable, the most relevant funding bodies are those that can facilitate and fund the upscaling of the resulting AIRSHIP model post-funded period. EU funding programmes and financial instruments as innovation and technology transfer facilitators.

The most important funding bodies at EU-level that are actively funding similar technologies and have common objectives with AIRSHIP are:

- Horizon Europe
- EIT Urban Mobility
- European Regional Development Fund
- LIFE
- Connecting Europe Facility

In the more advanced stages of the project, financing opportunities from these stakeholders will be monitored and discussed with the Consortium as part of the exploitation actions.

3.3.3. Regulatory Agencies

Regulatory agencies are key in ensuring the legality and safety of the AIRSHIP and guiding the design and implementation of technologies towards real life certification and use of the WIG craft. Though most of the stakeholders presented in the following table are public bodies that have been or are actively pursuing the development or implementation of WIG crafts and related technologies or that have served as test sites for related projects, a few private agencies that have previously worked in relevant technologies' qualifications are also included.

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Those regulatory agencies already engaged in the project via the currently ongoing activities are written in bold font in the list.

Table 5 Regulatory agencies

	Stakeholders name
Key Players	**Finnish Transport Agency**
	Swedish Maritime Administration
	Trafikverkert
	Väylävirasto
	Puerto de Granadilla
	Ministerio de Puertos de España
	Portos dos Açores
	Bureau Veritas Marine & Offshore
Keep satisfied	Port of Rauma
	Port of Gävle
	VNF - Voies Navigables de France
	CCNR (Central Commission for the Navigation of the Rhine)
	Hamburg Port Authority
Keep informed	Agenzia per il fume Po
	Uniontransporti
	Port of Amsterdam
	Port Authority of Cartagena
	De Vlaamse Waterweg
	ARNI (Regional Agency for Inland Navigation for Emilia – Romagna)
	Port of Antwerp
	Regione Lazio

3.3.4. Industry Partners

Industry partners are expected to have a significant contribution to the advancement of WIG craft technology through investment in technology transfer, production and supply chain management, market analysis, collaboration with other stakeholders and interest in upscaling projects post-funded period for AIRSHIP. Special consideration is to be given to the needs of the industry during the exploitation strategy implementation and the questionnaires.

Below a first-stage identification of the industry partners that have been or actively are involved in research projects about, own patents related to, or have an interest in the AIRSHIP technologies and objectives is

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presented. These stakeholders have been found through the partners' networks, the consortia of the identified projects and the use of Espacenet and prioritize shipbuilders and operators.

Table 6 Industry partners list

	Stakeholders name
Keep satisfied	Blom Maritime
	Kongsberg Maritime As
	Selfa Arctic AS
	Kongsberg Maritime AS
	Naval Dynamics AS
	Fraunhofer-Gesellschaft
Keep informed	Stichting Dutch Foundation for LNG as a Marine Fuel
	Interconsult Bulgaria Ood
	Stadt AS
	Wärtsilä Finland Oy
	Hensoldt Sensors GmbH
	Thales Alenia Space France
	Airbus
	Boeing
	Dassault Aviation
	Leonardo
	Safran
	MTU Aero Engines
	Fraunhofer-Gesellschaft

No key players are identified at this stage, as the current actions of the project will focus on end user requirements and research and funding partners towards a possible upscaling of the AIRSHIP.

3.3.5. End users

The end users of AIRSHIP technology considers both commercial and military organizations that would utilize and invest in Wing-in-Ground (WIG) crafts once developed. Their inclusion in the project is critical to ensure that the research aligns with practical, real-world applications, even though the AIRSHIP project is at a low TRL level currently.

Military organizations are important end users for the WIG technology, due to their need for innovative, rapid, and low-detectability transport solutions, however in this stakeholder analysis the focus is on civil applications.

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Producers, including WIG craft developers, play a pivotal role in the project's success. These entities are not only potential end users but also partners in innovation. Engaging with producers allows AIRSHIP for a collaborative approach to overcoming technical challenges and refining the technology to meet market demands. Important developers in this group include ST Engineering, Airfoil Development GmbH, and WigetWorks, creators of the WIG craft AIRFISH 8. Industry clusters, consisting of a network of companies, research institutions, and other stakeholders, are key for the adoption and dissemination of AIRSHIP technology. These clusters facilitate knowledge exchange, foster collaboration, and create synergies that can accelerate the development and commercialization of WIG crafts. Those stakeholders already engaged in AIRSHIP's activities are written in bold font.

Table 7 End users table

	Stakeholders name
Key Players	Fincantieri S.p.A.
	Arctia Ltd
	Sea Wolf Express OÜ
	Correos España
	Singular Aircraft
	STX
	WigetWorks
	Navantia
Keep satisfied	NCE Maritime CleanTech
	Boskalis Terramare
	DHL
	UPS
	Maritime Cluster of the Canary Island
	Airfoil Development GmbH
	ST Engineering
	TMC

3.4.6. Other stakeholders

During the desk research, a number of stakeholders that did not fit any of the aforementioned criteria and are relevant to the project were identified and classified in the below table. Most of these stakeholders will be contacted in the latter stages of the project, specially through surveys and questionnaires.

The main objective in engaging these "Other stakeholders" is to involve them in issues related to legislation, ethics, sustainable development and business plans. They could also be key for the advancement of alternative uses of the craft in the post-funding period.

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Table 8 Other stakeholders list

	Stakeholders name
Key Player	Marine South East Ltd
	Oceanic Platform of the Canary Island
	Spanish General Directorate of the Merchant Navy.
	INTA (Spanish National Aerospace Tecnical Institute)
Keep informed	The Research Council of Norway
	Swedish Environmental Research Institute (IVL)
	HHA Hamburger Hochbahn Aktiengesellschaft

3.4.7. AIRSHIP Key Stakeholders

The upcoming actions of the project will focus on identifying the interests, attitudes, spheres of influence, and knowledge of all the identified stakeholders, according to the categories set in the identification and profiling steps. Nonetheless, priority will be given to reaching, engaging, and finding synergies between AIRSHIP and the Key stakeholders identified through this exercise.

The stakeholder list presented below is comprised of those stakeholders of each category that were identified as Key Players through the stakeholders' matrix exercise explained in 3.1. Stakeholders' identification mapping.

Out of an initial pool of 4.715 results, 19 stakeholders are considered of high priority at this current stage of the project (M18). Out of these, 9 have been contacted and have agreed to be part of the project actions and surveys. Those are marked in bold font.

Table 9 Key Stakeholders List

	Stakeholders name
Research partners	Zemships
	ALICE (Eviation)
	Oceanic Platform of the Canary Island
	University of Gran Canaria

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End users	Fincantieri S.p.A.
	Arctia Ltd
	Sea Wolf Express OÜ
	Correos España
	Singular Aircraft
	Navantia
	Maritime Cluster of the Canary Island
	Canary Islands Aeronautical Cluster (CAAC)
Regulatory Agencies	Finnish Transport Agency
	Swedish Maritime Administration
	Trafikverkert
	Väylävirasto
	Puerto de Granadilla
	Ministerio de Puertos de España
	Portos dos Açores

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4. Stakeholders' engagement roadmap

The ultimate goal of this document is to outline the information collected and processed so far on the stakeholders to be engaged in Work Package 9 activities. For this, it is a crucial part of the process to design the methodology that will enable the WP leader and the Consortium partners to understand these stakeholders' motivations, interests, and particular situations that will provide valuable contributions for the development of AIRSHIP. Thus, acknowledging that this is an ongoing task and that the results will inform the development of Task 9.3, there is a need to create a roadmap for the continuation of stakeholders' engagement. As described in this section, the next steps include the creation of engagement protocols and tools, such as those for dissemination and data collection.

4.1. Methodology for stakeholders' data collection

4.1.1. Questionnaire for stakeholders

The methodological process envisioned to collect primary data from stakeholders will consist of various methods, starting with a questionnaire addressed to all stakeholders, regardless of the priority given and group/type assigned to them through the profiling and identification process. These categories will not be known by the respondent; hence, all stakeholders will respond to the questionnaire on equal terms. The objective of such a questionnaire will thus be to gather as much data as possible from a broad range of actors in relation to the development of an environmentally friendly, unmanned, WIG vehicle, with the view of categorising the experiences, solutions, and bottlenecks (technical or other) that emerge from their responses after the data is collected. The design of the questionnaire will consist of open-ended questions as well as multiple choice and raking questions, which overall will allow the respondents to openly offer their views while resulting in a structure fit for analysis. A preliminary template of the questionnaire for stakeholders has been developed and can be found in Annex II of this document. The WP leader reserves the right to conduct a follow-up questionnaire broadening its scope to cover concrete aspects relevant for *Task 9.3 - Road mapping* at a later stage.

Regarding the dissemination of the questionnaire, it will be sent to all stakeholders, Advisory Board members, and Consortium partners. Perhaps for some of them the questionnaire will be a follow up from their participation in a clustering event or any other action within stakeholders' engagement. For this task, the cooperation across all Consortium partners will be crucial to broaden the outreach and ensure a diverse scope of responses that will inform further actions in Task 9.3 and in WP9 as a whole.

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4.1.2. Interviews with Key stakeholders

The purpose of this method is to collect the diversity of perspectives from the most important stakeholders within and around the AIRSHIP value chain, and assess their position towards the proposed innovation, including the identification of challenges, bottlenecks, interdependencies across sectors and topics, and future perspectives for commercialisation and exploitation. The choice for this qualitative method is justified by the fact that a semi-structured interview with a reduced selected list of participants-stakeholders will further confirm, reassess, and broaden the scope of opinions and themes resulting from the questionnaire, allowing for a more detailed exploration of outcomes provided. The participation of said stakeholders in previous clustering events and/or the links with Consortium partners and other stakeholders already engaged in AIRSHIP will be a crucial elements to establish trust within the process and between the interviewer and the respondent. The coordination across project partners and the project Coordinator will determine the exact format of the interviews, which, when possible, shall be conducted in person.

As with all other data collected within this process, the collection and processing of interviews' data will be treated in line with European GDPR. Therefore, no personal information and traceability of respondents will be possible as data will be carefully processed, stored, codified and anonymised for analysis. Only partners responsible for the analysis will have confidential access to these data and results will be securely disseminated within the Consortium and feedback provided to the participants who agree to participate in the process by signing the informed consent form.

4.1.3. Delphi Survey

The Delphi Survey was originally developed as a technological forecasting technique, which aimed at reaching consensus over relevant technological developments. Nowadays, Delphi Surveys have expanded into a variety of modified approaches. However, at its core, the Delphi method stands out as a reliable method in situations where individual judgements must be elicited and combined to address an incomplete state of knowledge. The Delphi method is based on anonymous opinions of experts (in this case, the AIRSHIP Consortium partners, Advisory Board members, and Key stakeholders) who are fed back the results of a round-based survey, allowing these experts to rethink their judgment and converge to consensus over key identified areas.

The methodology consisting of the implementation of the Delphi method will be deployed within *Task 9.3*, as the Survey statements and the results of the Survey will be later on used for the preparation and development of the planned road mapping workshops (M30, M37, M44) and the scenarios envisioned for the future exploitation

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of AIRSHIP technologies. The goal of the Delphi Survey, which might be run in one or two rounds depending on the scope of topics and actors to be addressed, will contribute to the development of an exploitation strategy with a strong emphasis on creating sustainability for the project results after the project-funded period. The Delphi Survey will assess the potential for future development of the AIRSHIP technologies and value chain. In line with the Delphi method, respondents will be asked to rank and freely comment on a series of pre-defined statements, that will emerge from the analysis of the questionnaire results. Either in a second round or directly through the discussion workshops in the road mapping task, the experts will reassess the contributions and provide detailed and meaningful feedback for the continuation of the task. As such, it is worth noting that the role of the stakeholders' analysis described in the present deliverable and to be continued through Task 9.2 is crucial in providing the Key stakeholders whom the Delphi Survey will address. Similarly, Task 9.3 results obtained from the previous questionnaire and interviews as well as through the Delphi Survey will highlight and reassure or modify the list of identified Key stakeholders.

To conclude this Chapter, it is worth emphasising that the cooperation between Tasks 9.2 and 9.3 will constitute a reiterative and mutually beneficial process, as elucidated in Figure 7 below.

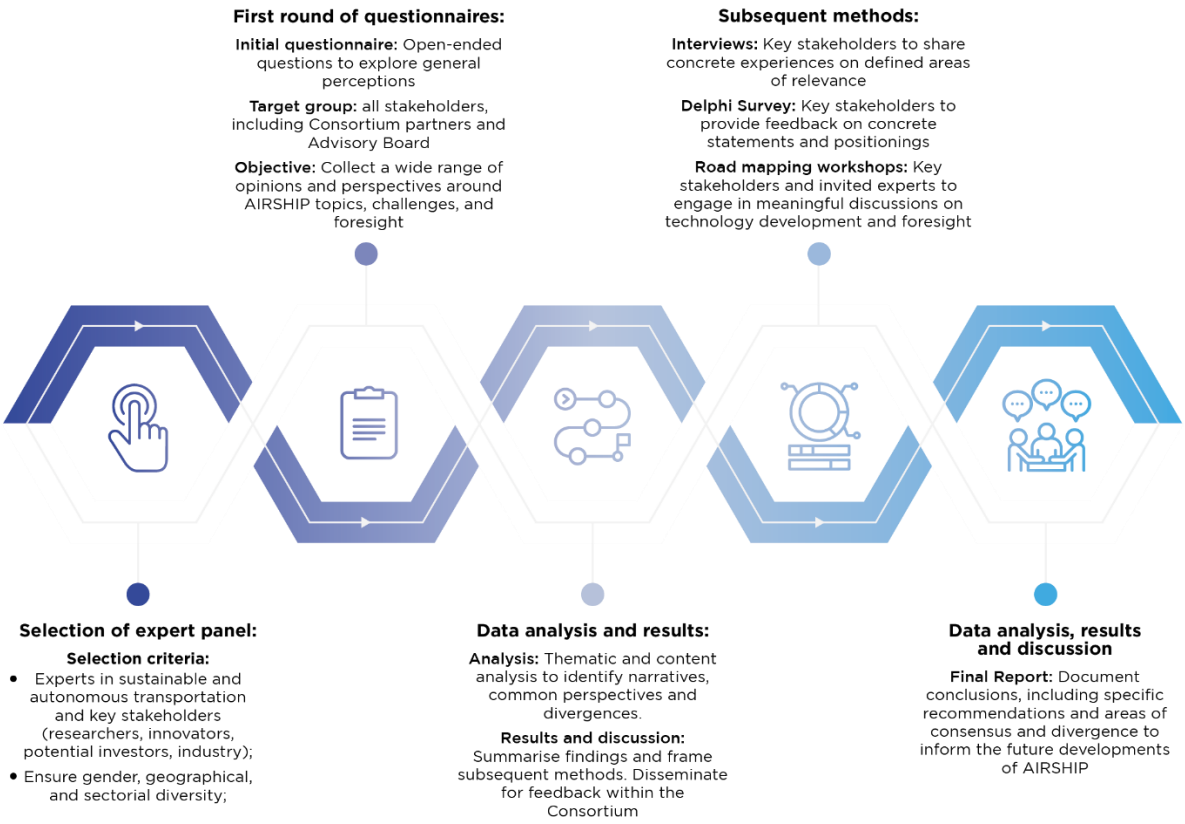

Figure 7 Interaction between stakeholders' analysis and stakeholders' engagement methods

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4.2. Use of results

The outcomes from the methodologies aimed at gathering stakeholders' experiences and perspectives at various stages of the project and AIRSHIP technological development will significantly influence multiple aspects of the AIRSHIP project, shaping the project's innovation strategy and roadmap. Insights gathered will inform market analyses, technology development priorities, and the update of future stakeholder collaborations. These results will be internally processed, thoroughly analysed, and shared at adequate times with the project Coordinator and Consortium partners so that they are integrated into the overall project planning and implementation to maximise the impact and sustainability of project results.

Furthermore, within WP9, these results will also facilitate clustering activities by identifying synergies among stakeholders, fostering collaboration, and enhancing knowledge exchange within the Consortium and with external actors. Moreover, the findings will steer the project's innovation agenda, influencing future research and development efforts and prioritising technological advancements to address challenges identified by Key stakeholders. Additionally, they will contribute to developing a comprehensive roadmap for the project, outlining milestones, timelines, and strategic initiatives essential for achieving project objectives in a structured and effective manner.

Integrating these results into project planning will ensure close alignment with stakeholder needs, strengthen project sustainability, and foster continuous improvements throughout the AIRSHIP project. At all times, data collected will be securely stored and anonymised to ensure all the process is conducted under European GDPR. As such, no data containing personal information or disclosing any details from participants to the different experiences will be shared with respondents and any stakeholders before processing and preparation of the results from the respective analyses. Hence, stakeholders engaged will receive feedback on their contributions without risk of traceability so that it is a fair process for all contributors and equality of treatment is ensured throughout the data collection phases, hence enabling trust to be further built after each method is implemented.

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4.3. Stakeholders engagement protocol

The objective of this protocol is to ensure that relevant regular updates are provided to stakeholders throughout the various phases of the project, thus ensuring that potential stakeholders understand the nature and scope of the project and the technologies under development and ensuring the maintenance of high stakeholder engagement levels. The protocol is outlined as follows:

Figure 8 Protocol for AIRSHIP stakeholders' engagement

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5. Conclusions

This document constitutes the second deliverable within the *Work Package 9 – Dissemination, Communication, and Exploitation* of the Horizon Europe project AIRSHIP Deliverable 9.2 – *Stakeholders' Analysis* defines the main groups of potential stakeholders, identifying a set of entities to be contacted and included in the project activities. The document also provides an insight into the methodologies designed for stakeholders' engagement and data collection regarding stakeholders' experiences and perspectives and outlines the first steps on how to contact and engage the identified players.

Lastly, this report represents the first step towards the future clustering and roadmap workshops to be continued through Tasks 9.2 and 9.3 and will serve as a path for the implementation of the activities envisioned under WP9 as a whole.

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Annexes

Annex I. First contact email for AIRSHIP stakeholders

Subject: Invitation to the AIRSHIP project's Stakeholders' network
Dear [name of the stakeholder], I trust this email finds you well. I am reaching out to you on behalf of the AIRSHIP project Consortium. We are writing to you to invite you to become one of the engaged stakeholders in the **AIRSHIP project**, together with many relevant stakeholders related to the AIRSHIP technology, vision, and objectives. As part of the project's Work Package 9 on Communication, Dissemination, and Exploitation of AIRSHIP technology, valuable outcomes, and results, we have conducted a detailed stakeholders' mapping and identified your [company, agency, project, initiative] as a key agent in [topic, in relation to AIRSHIP; e.g., WIG, maritime transport, autonomous/electric mobility, etc.]. By joining the AIRSHIP active stakeholders, you will be able to take part in AIRSHIP clustering activities, which seek to maximise the benefits of multistakeholder cooperation with other aeronautical, aviation, and electric mobility innovation actors across Europe for knowledge-sharing, identification of best practices, and fostering of future collaboration opportunities. We would like to ensure that the planned events and other networking opportunities are communicated to you and to all other interested stakeholders smoothly. Hence, we ask you to **please fill in this form** (*link*) to express your interest in being part of the AIRSHIP Community of Practice before the [date]. You will soon receive further information from our end. We thank you very much for your time and interest and look forward to collaborating with you, Do not hesitate to write to us for any questions or concerns, Kind regards, [Signature]

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Annex II. Draft of the AIRSHIP questionnaire for stakeholders

AIRSHIP Project – WP9: Survey for Innovation, Road mapping, and Exploitation of the technology

Purpose of the survey

The purpose of this survey is to collect feedback from the most important stakeholders related to the AIRSHIP project, identified through the stakeholders' mapping and analysis processes, to identify synergies and potential lines of collaboration as well as tools and solutions to solve current and future challenges throughout the technology development and exploitation. Overall, this survey will allow AIRSHIP Consortium to assess the state-of-the-art regarding the possible innovation and future exploitation roadmaps for the developing technologies and understand the relevant stakeholders' position towards the proposed innovation.

Data protection disclaimer

This survey is conducted in accordance with the EU General Data Protection Regulation (GDPR). The provided data will be collected and maintained with full confidentiality, they will be coded and anonymized from the point of submission and will no longer be individually identifiable; after this point it will be analysed and reported collectively.

Respondent's written consent

☐ I agree to the data being used for statistical purposes and understand that responses provided are anonymous and in line with European GDPR.

Question 1: Type of organisation (Please select)

a. Industry (private enterprise)
b. University / Research institution (public and private)
c. Public / governmental body
d. NGO (Non-Governmental Organisation)
e. Investor / Technology Transfer Organisation
f. Other. Please specify: [Open text]

Question 2: Position within the organisation
CEO
Technician
Main researcher
Early-career to collaborating researcher
Freelancer
Other. Please specify:

Question 3: Location of your organisation:
Open text

Question 4: Geographical coverage of your organisation:
Open text

Question 5: Main area of work (please select up to 3):
Inter-island transport
Inland waters transport
Other transport and logistics (e.g., electric mobility)
Autonomous ships
Autonomous transport (general)

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Wing-in-ground Robotics (and / or Artificial Intelligence) Power generation / Energy efficiency Carbon footprint / Zero-emissions Environmental law Social dialogue (e.g., labour market policies, working regulation, etc.) Other. Please specify:
Question 6: What are the main challenges that you identify in your sector nowadays? [Open text]
Question 7: Please rank the following elements related to the AIRSHIP technology according to their relevance for your sector *(on a scale of 1-5, where 1 = not relevant at all and 5 = completely relevant):* [Ranking. A list of statements will be provided according to the priorities for the development of the AIRSHIP technology and regional/country development trends]
Question 8: To what extent do you see a connection between your area of work and the AIRSHIP technology? [Open text]
Question 9: How did you hear about the AIRSHIP project? [Selection list of communication channels used]
Question 10: Is there anything else you would like to address? [Open text]
Consent to receiving further information about AIRSHIP: ☐ I agree to receiving further information about the AIRSHIP project, including external communications, newsletter, and relevant opportunities. Consent to future engagement in AIRSHIP: ☐ I agree to being contacted via the contact information provided in this forms to participate in future engagement opportunities from the AIRSHIP project.

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Annex III. Stakeholders' Analysis – Complete list.

		Stakeholders name
KEY PLAYERS	Research partners	Zemships
		ALICE (Eviation)
		Oceanic Platform of the Canary Island
		University of Gran Canaria
	End users	Fincantieri S.p.A.
		Arctia Ltd
		Sea Wolf Express OÜ
		Correos España
		Singular Aircraft
		Navantia
		Maritime Cluster of the Canary Island
		Canary Islands Aeronautical Cluster (CAAC)
	Regulatory Agencies	Finnish Transport Agency
		Swedish Maritime Administration
		Trafikverkert
		Väylävirasto
		Puerto de Granadilla
		Ministerio de Puertos de España
		Portos dos Açores
KEEP SATISFIED	Research partners	ONERA - The French Aerospace Lab
		CIRA (Italian Aerospace Research Centre)
		Vaeridion
		Cyprus Marine and Maritime Institute
	Regulatory Agencies	Port of Rauma
		Port of Gävle
		Port Authority of Cartagena
		VNF - Voies Navigables de France
		CCNR (Central Commission for the Navigation of the Rhine)
		Port of Antwerp
		Hamburg Port Authority
		Bureau Veritas Marine & Offshore
		Regional Agency for Inland Navigation for Emilia-Romagna

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KEEP INFORMED	Industry	Blom Maritime
		Kongsberg Maritime As
		Selfa Arctic AS
		Kongsberg Maritime AS
		Naval Dynamics AS
		Fraunhofer-Gesellschaft
	End users	NCE Maritime CleanTech
		Boskalis Terramare
		DHL
		UPS
		TMC
	Research partners	CICERO Senter for Klimaforskning
		Asociación Centro Tecnológico Naval y del Mar (CTN)
		Universidad Politécnica de Cartagena (UPCT)
		Universitat Politècnica de València (UPV)
		Universiteit Antwerpen
		University of Gdańsk
		Technische Universität Berlin (TUB)
		Zulu Associates
		CETENA S.p.A.
		CEITEC - Central European Institute of Technology
		Deutsches Zentrum für Luft- und Raumfahrt (DLR)
		Cobham Aerospace Communications
		ONERA - The French Aerospace Lab
		Luleå University of Technology
		Blekinge Institute of Technology
		Kaunas University of Technology
		Gdansk University of Technology
		Riga Technical University
		Lappeenranta-Lahti University of Technology LUT
		Vilnius Gediminas Technical University
		University of Tartu
		Marstal School of Maritime and Technical Engineering
		Chalmers University of Technology
		Kiel University
		Aalto University Foundation
		University of the Aegean
		Technological Institute for Renewable Energies of the Canary Islands
		Zanasi &Partners
		Porvalor
	Regulatory Agencies	Agenzia per il fume Po
		Uniontransporti

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		Port of Amsterdam
		De Vlaamse Waterweg
		Regione Lazio
	Industry	Stichting Dutch Foundation for LNG as a Marine Fuel
		Interconsult Bulgaria Ood
		Stadt AS
		Wärtsilä Finland Oy
		Hensoldt Sensors GmbH
		Thales Alenia Space France
		Airbus
		Boeing
		Dassault Aviation
		Leonardo
		Safran
		MTU Aero Engines
		Fraunhofer-Gesellschaft
	Other	The Research Council of Norway
		Swedish Environmental Research Institute (IVL)
		HHA Hamburger Hochbahn Aktiengesellschaft
LOW EFFORT	Research partners	The Manchester Metropolitan University
		The University of Reading
		Universität Wien
		Eidgenössische Technische Hochschule Zürich
		Universität Leipzig
		Technische Universiteit Delft
		Zürcher Hochschule für Angewandte Wissenschaften
		Forschungszentrum Jülich GmbH
		Centre National de la Recherche Scientifique
		Satakunta University of Applied Sciences
		UMOE Advanced Composites
		Univesity of Tromsø (UIT)
		Łukasiewicz - Poznań Institute of Technology
		ENEA
		CERTH
		Newcastle University
		TNO (Netherlands Organization for Applied Scientific Research)
		EICB (Expertise and Innovation Centre Barging)
		Università degli Studi di Roma Tor Vergata
		National Technical University of Athens
		University of Strathclyde
		TWI Ltd

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	University of Southampton
	University of Stuttgart
	Thales Alenia Space France
	Inmarsat Global Limited
	Selex ES S.p.A.
	OHB System AG
	Cranfield University
	Université de Toulouse III - Paul Sabatier
	Technische Universität München
	Universiteit Gent
	Universität Stuttgart
	Technische Universiteit Delft
	Ecole Centrale de Nantes
	Politecnico di Milano
	Delft University of Technology
	University of Cambridge
	University of Bristol
	University of Bologna
	The University of Liverpool
	University of Miskolc
	University of Porto
	VŠB - Technical University of Ostrava
	SINTEF
	University of Ljubljana
	Interdisciplinary Centre for Mathematical and Computational Modelling, University of Warsaw
	ZSI (Centre for Social Innovation)
	Satakunta University of Applied Sciences
	Häme University of Applied Sciences
	Campus Gotland, Uppsala University
	Lappeenranta-Lahti University of Technology LUT
	Linde AG (SID-Advanced Customer Aplications)
	Germanische Lloyd AG (Process-and Fuel Cell Technology)
	Hochschule für Angewandte Wissenschaften
Industry partners	Tarbit
	TECO 2030
	Shell
	Società di consulenza - SOGESCA
	PersEE
	Ballard Europe

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	Ciaotech Srl
	Pno Innovation Sl
	Upm-Kymmene Oyj
	Blue Line Logistics
	Eidsvaag As
	Corvus Energy AS
	ABB AS
	Rheinmetall Defence Electronics GmbH
	Dassault Aviation
	ONERA - The French Aerospace Lab
	DLR - German Aerospace Center
	4d_coders
	Rolls-Royce
	GKN Aerospace
	Liebherr Aerospace
	Proton Motor Fuel Cell GmbH
Other	Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA)
	SLOVSEFF III
	Fondation Nationale des Sciences Politiques (Sciences Po)
	RTU Riga Business School
	Alster Touristik GmbH
	ETC-Consulting Group Ltd

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